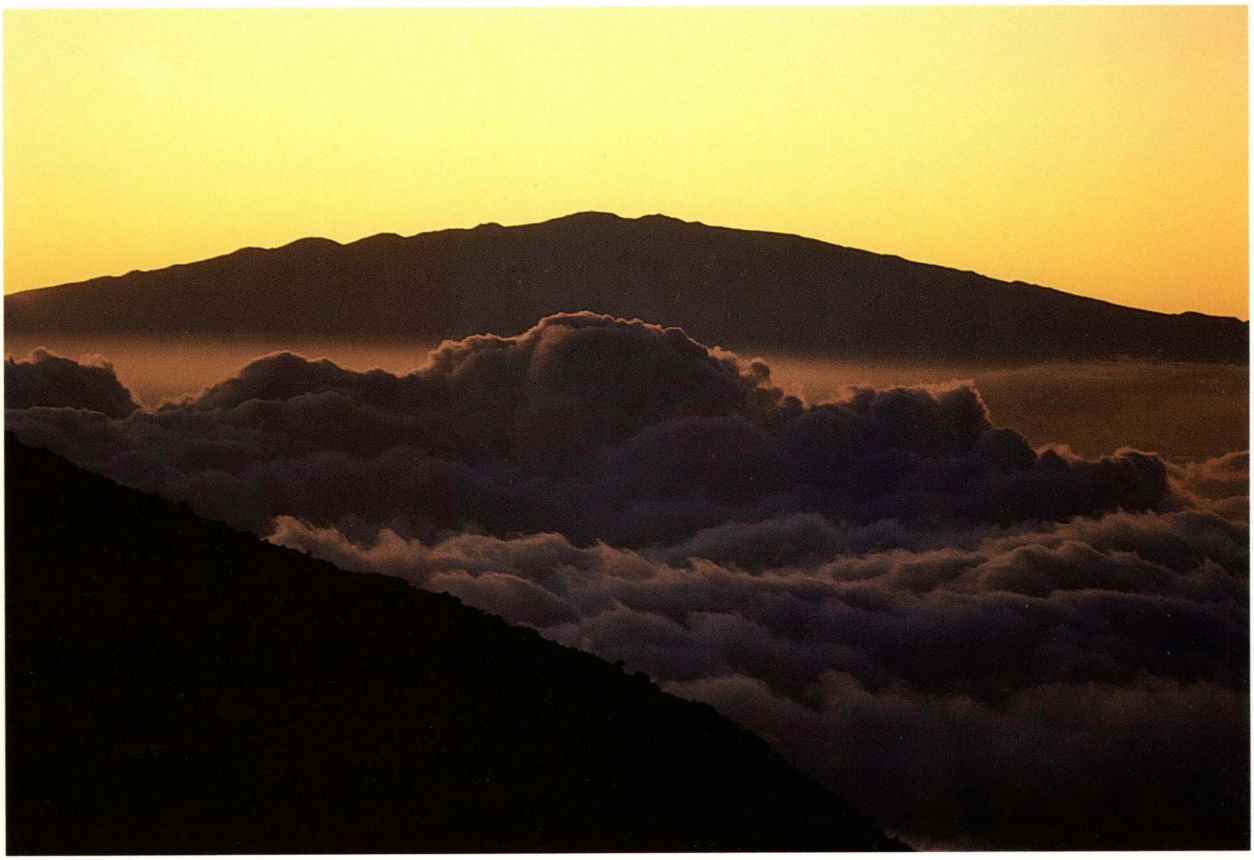

GEOTHERMAL EXPLORATORY MISSION TO JAPAN

A Report to the
Governor's Advisory Board on the
Underwater Cable Transmission Project

Geothermal Exploratory Mission to Japan

A Report to the Governor's Advisory Board
On the Underwater Cable Transmission Project

December 8, 1987

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Geothermal Exploratory Mission to Japan

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Executive Summary

This is a report to the Governor's Advisory Board on the Underwater Cable Transmission Project summarizing the results of a geothermal exploratory mission made to Japan.

The purpose of the mission was to acquaint cable and field developers and financial institutions in Japan with the potential for developing geothermal energy in Hawaii.

Our message was brief and to the point: We are serious about developing our geothermal resource, and we are seeking potential developers and financing to help us develop that resource.

The response by the Japanese companies we talked with was enthusiastic and heartening. Several of the companies we talked to expressed strong interest in the project and have made further contacts with us since our return from Japan.

Because of the enthusiastic response we received, we are also making recommendations to the cable commission for further action to expedite as quickly as possible the development of our geothermal resource.

Introduction

This report is a summary of our recent geothermal exploratory mission to Japan. Briefly, the mission was intended to make cable and field developers and financial institutions in Japan familiar with the potential for geothermal development in Hawaii. We thought Japan would be an appropriate place to start because of the recent strength of the yen in the world currency markets, the possibility of favorable financing there, the technical expertise of Japanese corporations in cable and field development and the increased interest in that country in investment in Hawaii.

Background

Mayor Dante K. Carpenter was the mission leader. Thanks to letters of introduction from Acting Governor Benjamin Cayetano and Cable Commission Chairman William F. Quinn, the mayor represented not only the interests of the County of Hawaii, but the Governor's Advisory Board on the Underwater Cable Transmission Project as well.

Besides Mayor Carpenter, others on the mission to Japan were:

–William Kikuchi, Senator Daniel K. Inouye's field representative.

–William Bonnet, chief of Hawaiian Electric's deep water cable program.

–Harold Tanouye, chairman of the Mayor's Geothermal Energy Advisory Committee.

–Lawrence Kumabe, deputy attorney general and a member of the mayor's geothermal committee.

–Minoru Shintani, acting director of the Hawaii County Department of Research and Development.

Chairman Quinn and Dr. Fujio Matsuda were also invited to go along, but they were unable to join the trip.

The idea was to form a group of representatives from Hawaii as broad-based as possible. The group represented the state and county governments, Senator Inouye's office, the governor's advisory board, the mayor's geothermal committee and Hawaii's major electric utility.

Although brief, our presentations to the prospective developers in Japan apparently conveyed the message. Representing a cross-section of state and county government, the cable program and Hawaii's major utility company, we described the roles of the represented organizations in geothermal development and gave a progress report on development efforts.

We also informed the Japanese developers that two of the primary obstacles to geothermal development in Hawaii had been recently eliminated.

Technical feasibility of the deep water cable

Because of continued funding by the federal government and support from Senator Inouye, the program is both on time and on budget. It will demonstrate that it is feasible to transmit 500 megawatts of electrical power by deep water cable from the Big Island through the Alehuihaha Channel to Maui and then on to Oahu. At its deepest, the channel is more than 2,000 meters below the surface.

State and county regulatory environment

Until recently, the progress of geothermal development in Hawaii had been seriously impeded by a difficult regulatory environment. The Campbell Estate and True/Mid-Pacific venture geothermal venture, for example, had been mired in contested case hearings over geothermal permits for more than five years at a cost of millions of dollars.

Such a long delay can be fatal to any well-organized development, but in the past two years, the picture has changed.

–The estate was finally able to obtain the permits for geothermal development on state conservation lands.

–The Hawaii State Supreme Court decided that the permits were free from state or federal constitutional defects based on religious beliefs or environmental considerations.

–With support from the State Department of Land and Natural Resources, the State Department of Business and Economic Development and other government agencies and business and labor groups, the County of Hawaii was able to eliminate the trial-like contested case hearings from the geothermal permitting process at last year's session of the State Legislature. This legislative victory symbolizes the current favorable regulatory environment in Hawaii.

–Also during the past session of the Legislature, the governor was able to create the cable advisory board to expedite cable and field financing and development.

Various legislative leaders, such as State Senator Richard Matsuura, have visited Japan recently, and they have given their support to geothermal energy.

Finally, in a significant commitment, Hawaiian Electric has indicated it is eventually willing to purchase 500 megawatts of power generated by geothermal energy.

Response by Japanese Developers

The comments by the group were uniformly well-received. The positive responses by the Japanese companies far exceeded the group's expectations.

The responses by the Japanese companies are in the order of interest shown by each, not on the order that the group met them.

Sumitomo Electric Industries

The mission began Tuesday with a two-hour meeting and lunch with Sumitomo Electric and ended Friday with a seven-hour meeting that included dinner. The meeting with Sumitomo was successful far beyond the group's expectations.

In the course of the meetings, the company covered the following aspects of cable and geothermal development.

Technical

Sumitomo is the largest manufacturer of deep sea underwater electrical cables in the world. It has manufactured more than 2,000 miles of cable. The company recently completed undersea electrical cables capable of transmitting 1,250 megawatts of electrical power from coal-burning plants on mainland China to Hong Kong.

By comparison, our cables in Hawaii would need to transmit only 500 megawatts of power, although through a much deeper channel.

Sumitomo has completed similar undersea electrical cables to transmit power from Hokkaido to Honshu and from Shikoku to Honshu.

It also has a patented process, PPLP (Polypropylene Laminated Paper), which is widely used as a strong, lightweight cable insulating material. If the cable is built by Sumitomo, no royalties need be paid for use of this material or process.

In addition, the shipping time from Sumitomo's Osaka plant to Honolulu could be as little as 15 days. A cable brought from Europe could take 31 days or longer, depending on sea conditions. In other words, the cost of a cable purchased from Japan could be much lower than a similar cable purchased elsewhere.

Financial

We were honored to have Asao Ito, deputy president of Sumitomo, its second highest ranking officer, to explain personally the financial aspects of the cable and geothermal development to us. Mr. Ito suggested that well drilling and steam gathering, power plant construction, transmission line construction and cable construction and installation could be done by a consortium of companies in Japan under one financial package organized by Sumitomo.

He suggested Sumitomo could raise as much as $1.5 billion in the world's financial markets or in Japan for both cable and field development on the Big Island. Sumitomo realizes, as we all do, that without adequate financing both for well drilling, steam gathering and electrical generation

plants and transmission lines, as well as for the cable, there can never be substantial geothermal development in Hawaii.

Sumitomo had prepared to meet with Mitsubishi Heavy Industries to discuss the construction of power plants and then, with prospective steam field developers, to examine the costs of drilling geothermal wells.

During the course of the group's visit, he explained, the board of directors of Sumitomo Electric met twice. Funds for geothermal field and cable development could be made available at an interest rate of about 6 percent. Details, such as should the financial plant be in yen or in dollars, must still be worked out.

Sumitomo is definitely interested in presenting us with a comprehensive financial package for field and cable development.

Political climate

Atsushi Mano, a senior managing director with Sumitomo and former cabinet minister with the Ministry of Trade and Industry, met with us and explained the political aspects of the project.

Japan and the United States are at a crucial period in their diplomatic and political relationship, he said. Japan is extremely concerned with maintaining a cordial relationship with the United States. Within the United States, Sumitomo feels, Hawaii is the state where this relationship could be closest.

Our project could have a tremendous impact on the relationship between our two countries, Mr. Mano said. It could be a tremendous asset in

international relations, having a significance far beyond its financial, business or technical aspects.

Japan now has a new prime minister, and when he visits the United States in February, the $1.5 billion project in Hawaii could be one of the leading examples of intergovernmental cooperation between the United States and Japan. It could demonstrate Japan's desire to reduce the trade deficit by investing in a valuable energy project in the United States that would otherwise be extremely difficult to organize and finance.

We were then taken to dinner by Dr. Keiji Kojima, a managing director of Sumitomo. At dinner, our hosts reminded us how extremely rare it is for the deputy president and senior managing director to address a group like ours on its first meeting. We replied that we understood their message and the magnitude of its implications.

Mitsubishi Heavy Industries/Toyo Menka

On Tuesday morning, we met with Mitsubishi Heavy Industries and with Toyo Menka. Mitsubishi is one of the world's largest suppliers of geothermal power plants, and it is building power plants in the Geyser's area and in the Imperial Valley. Toyo Menka is the seventh largest trading company in Japan and represents Mitsubishi Heavy Industries in Hawaii.

Toyo Menka expressed strong interest in financing the construction of Mitsubishi geothermal power plants in Hawaii, and it will be meeting with Sumitomo Electric to discuss the possibility of organizing a consortium in

Japan for the development and financing of both the geothermal energy fields and the deep water cable.

Mitsubishi Trust and Banking

Our meeting with Mitsubishi Trust and Banking also proved to be rewarding. Since Mitsubishi Heavy Industries is a prospective power plant developer in Hawaii, Mitsubishi Trust, as a company from the Mitsubishi group, was intriged by the possibility of financing the venture.

If it chose to finance field and cable development, it estimated that raising $1.5 billion would not be unreasonable for the venture. Mitsubishi Trust competes in the world's financial markets on major projects like this with other international banks. If the rate of return was acceptable, an investment in the United States and, in particular, Hawaii would be considered a safe investment and reasonable risk.

As an indication of its interest in the project, the company had a cable waiting for us on our return urging us to send it additional information so it could begin assessing the economic feasibility of the project. The company called us a few days later to follow up on its cable message.

Nissho Iwai/Japan Petroleum Exploration Company (JAPEX)

We met with JAPEX on Tuesday afternoon and again at noon Friday. We met with Nissho Iwai on Friday morning.

Nissho Iwai, the sixth largest trading company in Japan, also expressed interest in our project. Since we last corresponded with the company about a year ago, it wanted further information on our progress.

The company is currently in partnership with Unocal and JAPEX to develop a 50 megawatt geothermal power plant for Kyushu Electric Company.

Although Unocal is the largest geothermal developer in the world, it has so far demonstrated little interest in developing the Kilauea fields.

JAPEX is 70 percent owned by the government of Japan. Assuming that a consortium is organized from Japan, JAPEX could be a potential participant. It is involved in exploration and drilling of oil, gas and geothermal wells both in Japan and throughout the world.

The company was aware of the Kilauea fields, and some of its employees personally knew some of the geologists at the Institute of Geophysics at the University of Hawaii, whom they met periodically at international conferences.

JAPEX may be interested in sending a field team to Hawaii to examine our geothermal fields and the data gathered by geologists, geophysicists and geochemists.

Tohoku Electric Power

Tohoku Electric operates power plants and distributes electricity in northern Honshu. With annual sales of about $7 billion and profits of about $346 million last year, it is about 10 times the size of Hawaiian Electric.

The company operates some of the largest geothermal power plants in

Japan at Kakkonda. Under the proper conditions, Tohoku also could become interested in exploration, drilling, power plant operation or capital investment in Hawaii.

We met with the company on Tuesday afternoon, and company officials took us to dinner that evening.

Long-term Credit Bank of Japan

Long-term credit is a relatively new bank in Japan that concentrates on commercial and industrial financing.

Company officials indicated they would be very interested in financing both field and cable development in Hawaii, but they said where *zaibatsu* groups are involved–such as Sumitomo, Mitsubishi or Mitsui–the groups rely on banks in their own groups and may not involve Long-Term Credit. If the proper situation were to arise, however, the company would be interested.

Ministry of Trade and Industry

On Thursday morning, we met with representatives of the Ministry of Trade and Industry.

Although Japan would like to encourage more geothermal energy development, it has similar problems to those that have plagued developers in Hawaii. There is often strenuous opposition from environmentalists, since much of Japan's geothermal resources are in national parks.

In addition, Japan's geothermal resources are apparently harder to extract than comparable resources in Hawaii.

Although the Japanese government subsidizes new exploration and development, it is not a developer. The primary initiative for our project, therefore, will probably be through private industry, like Sumitomo Electric, rather than through a government ministry.

Summary

In summary, the consensus of our group was that we could not have received a more favorable reception to our ideas. We felt we should do whatever we can to make geothermal development a reality as soon as possible.

Recommended Action

We believe the trip accomplished the major goals we set for ourselves. We now have a promising incentive to move forward quickly to expedite progress in developing our geothermal resource. The potential political, financial, technical and public benefits of geothermal development exceeds all expectations.

To take advantage of the momentum that has been created, we offer the following action plan:

Coordination

A meeting or discussion should be organized quicly with Senator Inouye, Governor John Waihee and Mayor Carpenter to discuss the possibility of using Hawaii's geothermal project as an instrument to promote better international relations between the United States and Japan.

By using this project as an opportunity for political initiative, as suggested by Sumitomo, Hawaii's leaders could exercise tremendous diplomatic leadership here. It should be a bipartisan effort.

Quick action is critical, however. Sumitomo has suggested that this project could be part of Prime Minister Takeshita's visit to the United States as early as next February.

As a result, Hawaii's action plans for its financial, organizational and legislative programs must also be discussed immediately.

Financial

Sumitomo has proposed what we all know—that field development and financing must be coordinated with cable development and financing.

No cable developer would build and finance a cable without being assured that there are 500 megawatts of power to transmit. No field developer would drill and explore the geothermal fields and commit itself to building a power plant unless there is some assurance that a cable will be built to transmit the power to Oahu.

Consequently, it is crucial at this time to expand the scope of the cable advisory board to include developing and soliciting plans to finance and organize *both* field and cable development. We recommend forming a subcommittee to prepare the necessary legislation and other groundwork to accomplish this.

Potential developers like Sumitomo may want to propose a financial plan not just for the cable, but for the entire geothermal development project. This would amount to a $1.5 billion proposal.

Whether there is a continuing need for public financing and guarantees should also be examined immediately.

Organization

An expanded geothermal board should examine not only ownership of the cable, but of the steam fields, power plants, converter stations and transmission lines.

The entity that will operate any or all of these elements should also be studied. The board, power district or other entity established or given the

authority over this area should oversee not only the cable, but overall geothermal development as a whole. And appropriate legislation should be drafted for the next session of the Legislature.

Communication

Once an initial understanding is reached among Senator Inouye, Governor Waihee, the cable advisory board and Mayor Carpenter, we should begin informational meetings with Congressmen Akaka, the rest of our congressional delegation, the leaders of Hawaiian Electric, the Legislature, the Big Island County Council, business and labor leaders and others who will be instrumental in assembling and supporting our legislative package in the crucial 1988 session–just as we did before the last session.

The mayor's task force, with this broad base of representatives, was instrumental in securing passage of needed legislation during last year's session.

Further Approaches

Finally, the time also appears to be right for a geothermal exploratory mission to California. Since we approached potential steam field and power plant developers in Japan, it is now appropriate to approach large mainland geothermal developers as well. Steam field developers like Unocal are already in partnership with Japanese firms in geothermal development in Japan. It would enhance our ability to assess the proper structure for

Hawaii's geothermal development to approach mainland geothermal developers like Unocal now.

In developing our own organizational structure, financing and regulations, it would also be helpful to find out how California's utilities and regulatory agencies handled similar issues. Their expertise and experience and might be valuable. The Geysers project has proved to be very successful: It generates 1,850 megawatts of power for the San Francisco area.

The California mission could be coordinated with Region IX of the Federal Department of Energy and could involve meetings with the California Energy Commission, Pacific Gas and Electric, various regulatory agencies and power districts and field developers in the Geysers, like Unocal and Geothermal Resources International. Geothermal Resources International is in the process of purchasing Thermal Power.

Conclusion

The most important accomplishment of our visit to Japan, at least in our own minds, is that there are companies with the necessary experience, expertise and financial capability who are interested in developing geothermal energy in Hawaii.

There is no question about the need to develop geothermal energy in Hawaii. It will provide us with a source of steady electrical power for generations to come, and it will help help free us from our dependence on outside oil.

With the proper coordination and effort, we have in our grasp the opportunity to make a reality the development of geothermal energy within the next 20 years.

The development of this energy resource has been stymied far too long. The time for action on this issue is now.

Appendix A

Members of Mission to Japan

Dante K. Carpenter
Mayor, County of Hawaii
Member, Governor's Advisory Board on the Underwater Cable Transmission Project

William Kikuchi
Field Representative, U.S. Senator Daniel K. Inouye

William Bonnet
Chief of Deep Water Cable Program, Hawaiian Electric Co., Inc.

Harold Tanouye
Chairman, Mayor's Geothermal Energy Advisory Committee, County of Hawaii

Lawrence Kumabe
Deputy Attorney General, State of Hawaii
Member, Mayor's Geothermal Energy Advisory Committee, County of Hawaii

Minoru Shintani
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Asia Keirin Center

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Appendix B

EXECUTIVE CHAMBERS

HONOLULU

JOHN WAIHEE
GOVERNOR

November 16, 1987

The Honorable Dante K. Carpenter
Mayor, County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mayor Carpenter:

Thank you for your letter of October 28, 1987, concerning the development of geothermal energy and your suggestion of a trade mission to Japan to generate Japanese interest in developing our geothermal resources.

While supportive of your suggestion, I ask that this matter be coordinated with Mr. Roger A. Ulveling, Director of Business and Economic Development, and Mr. William F. Quinn, Chairman of the Governor's Advisory Board on the Underwater Cable Transmission Project. As you may know, I have asked Mr. Quinn and the cable board to expand the role of the board to include geothermal development as well as the development of the cable system.

With kindest regards,

Sincerely,

JOHN WAIHEE

cc: Hon. Roger A. Ulveling
Mr. William F. Quinn

Appendix C

In August, the County Council gave its backing to the State Department of Transportation's plan to lengthen Keahole Airport's existing runway as a part of a 20-year, $156 million expansion plan for the facility. The much needed expansion has crossed some major hurdles and construction looks imminent.

The county is laying the ground work for business development in Hilo and the surrounding area. Some planned projects include an enterprise trade zone, a foreign trade zone, and a cargo transport and distribution center at Hilo airport. In the enterprise trade zone, the county intends to offer businesses credits on taxes and insurance, exemption from excise taxes, business promotion, and reduced red tape in business start-ups and building permits.

SUMMARY

It appears that the Island of Hawaii has finally arrived in its long trek down the road to economic prosperity. Basic economic indicators as well as most industry statistics point to the growing strength of Hawaii's economic base. The overall upbeat feeling on the island is well founded. The visitor industry is laying the ground work for what appears to be tremendous growth ahead. Diversification and increased productivity in sugar and diversified agriculture have taken place. Further developments at NELH, the HOST park, the space industry, and the Mauna Kea Observatory suggest an increasing contribution of high-tech industries to the island's economic base. Renewable energy projects continue their important world-class research.

These developments will have enormous implications for economic growth and job creation. Because they will be occurring on both the east and west sides of the county, a more balanced pattern of development can also be expected in the future. Clearly, much will need to be done to accommodate the needs of a growing population and economy. But, with increased cooperation between government, business, and the community, the outlook appears brighter than ever for the economy of Hawaii County.

Hawaii County Statistics

	Unit	Period	1982	1983	1984	1985	1986	Jan.-July 1987	% change Jan.-July 1987/1986	% change Annual 1986/1985
Population, Resident	number	July 1	100,130	102,880	107,169	109,159	111,800	n.a.	n.a.	2.4
Civilian Labor Force	number	mo. avg.	45,450	46,600	46,850	48,000	50,850	53,550	3.3	5.9
Employment	number	mo. avg.	41,050	42,350	43,100	44,100	47,000	50,050	5.3	6.6
Unemployment	number	mo. avg.	4,450	4,300	3,750	3,250	3,850	3,550	−17.4	−9.4
Unemployment Rate	percent	mo. avg.	9.8	9.2	7.7	8.5	7.6	6.6	−20.5	−10.6
Total Job Count[1]	number	mo. avg.	37,800	38,600	39,400	40,050	43,100	45,450	3.4	7.6
Gross Business Receipts	mil. $	total	1,246.2	1,380.9	1,569.8	1,594.5	1,642.4	1,009*	19.6	3.0
State Tax Collections[2]	thous. $	total	52,484	65,787	73,867	79,288	92,073	60,427	12.0	16.1
Visitor Expenditures	mil. $	total	200.9	277.2	248.9	285.9	343.8	n.a.	n.a.	20.3
Estimated Westbound Visitors	thous.	total	678.2	714.0	760.9	697.4	787.6	473.1	−0.1	12.9
Hotel Inventory (February)	number	February	7,167	7,469	7,149	7,511	7,280	7,328[3]	−2.4[3]	−3.1
Hotel Occupancy	percent	mo. avg.	44.2	46.3	55.6	57.6	62.9	57.4	0.5	9.2
Construction Put In Place	thous. $	total	78,707	78,112	80,465	81,102	95,769	62,341*	28.7	18.1
Private Permits	thous. $	total	75,209	88,015	90,347	121,439	231,501	73,406	−59.9	90.6
Residential Permits	thous. $	total	61,056	56,852	64,370	83,554	69,106	52,994	35.1	−17.3
Non-Residential Permits	thous. $	total	14,153	31,163	25,977	37,885	162,395	20,412	−85.8	328.7
Public Contracts Awarded	thous. $	total	22,919	20,153	23,057	18,520	37,716	23,530	25.7	103.7
Real Estate Resales										
Single Family	number	total	281	378	325	416	565	341	24.0	35.8
Average Price	dollars	cum. avg.	96,249	91,796	89,036	93,775	102,141	114,227	13.6	8.9
Condominium	number	total	58	127	95	93	142	111	42.3	52.7
Average Price	dollars	cum. avg.	123,200	95,535	91,019	97,718	104,186	138,737	53.3	6.6
Sugar Production, raw sugar 96°	thous. tons	total	369	392	391	319	329	126*	−−6.0	3.1
Diversified Crops and Livestock	thous. $	total	89,121	91,824	91,215	101,277	n.a.	n.a.	n.a.	n.a.
Diversified Crops[4]	thous. $	total	65,344	67,951	67,982	79,155	n.a.	n.a.	n.a.	n.a.
Livestock	thous. $	total	23,777	23,873	23,233	22,122	n.a.	n.a.	n.a.	n.a.

[1]Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.
[2]Totals do not include real property taxes.
[3]Compares February, 1986 to February, 1985.
[4]Total crops excluding sugar.
n.a. = not available
**Period is Jan.-June*

RESEARCH DEPARTMENT
NEIGHBOR ISLAND PROFILES
SEPTEMBER/OCTOBER 1987

ECONOMIC INDICATORS

NEIGHBOR ISLAND PROFILES

HAWAII COUNTY IN 1987

For the past several years the Island of Hawaii appeared to lag the other counties on the road to economic prosperity. While it has been a much longer road than expected, the Big Island may finally be arriving. Growth in cumulative gross business receipts during the first half of 1987 hit a record $1 billion. This was up a resounding 20 percent from the same period last year, far above the growth rates of the neighboring counties.

Tourism is a major factor in this emerging growth scenario. With over $1 billion of resorts planned, or under construction, and an additional $500 million slated for tourism-related infrastructure development, the Big Isle will be attracting more than its usual share of the visitor market over the next few years.

Agriculture fueled the Big Isle's recent strong economic growth. Sugar production will end up at around the same level as last year, but substantial growth was realized in diversified crops, particularly in macadamia nuts, potted and cut flowers, bananas, guava, and papaya.

The Hawaii Ocean Science and Technology (HOST) park has broken ground and will soon house several commercial high-technology enterprises. Tenants of this 540-acre park will occupy 3- to 20-acre parcels and specialize in a variety of aquaculture projects. Other uses of the HOST park will include the research and development of alternate energy systems, marine biotechnology labs, specialty agriculture, ocean instrumentation, and a visitor center. In addition to on-going closed-cycle ocean thermal energy conversion experimentation, the Natural Energy Laboratory of Hawaii (NELH) is researching alternative uses for the nutrient-rich water pumped through their deep-ocean water pipe.

With fast-paced economic development looming on the Big Island, the inadequacy of the island's infrastructure remains a major issue. Availability of water for existing farmers and future resorts and residents, lack of affordable housing, inadequacy of present sewage and solid waste disposal systems, traffic congestion, and the maintenance of roads and highways are just some of the major concerns of Big Island elected officials and residents.

TOURISM

Visitor counts on the Big Island looked encouraging considering that this was an overall slow year for tourism statewide. Through July, westbound visitor counts held steady, while occupancy rates slipped 1 percent from the 1986 average to 64 percent. The Big Isle's stable performance through 1987 may be attributable to a combination of several reasons including: stepped-up Hawaii Visitors Bureau and county promotional efforts; an unusually high level of volcano activity; the wider appeal of Big Isle sporting events; and increased interest in Mauna Kea observatory activity.

The $360-million Hyatt Regency Waikoloa is in its ninth month of construction, ahead of its scheduled completion date of September 1988. This new resort alone will employ some 1,800 persons and add 1,244 rooms to the hotel inventory of the Kona Coast, effectively doubling the existing number. Other large resort developments in the works include: the 450-room Ritz-Carlton, which has just been approved for construction; and the $350-million, 450-room, Hapuna Beach resort, which is in its final planning stages, and the Kaupulehu Resort, a 600-room hotel just south of the Kona Village.

The existing Sheraton Waikoloa, Mauna Lani, and Westin Mauna Kea resorts are doing well with stable occupancy rates and several sold-out months for the remainder of the year. The Keauhou Beach Hotel and the Kona Lagoon Hotel are being renovated at a cost of $5 million by their new owner Azabu U.S.A.

SUGAR

Overall, the sugar industry is expected to stabilize and possibly rebound in the future despite currently gloomy statistics. Through June, sugar production slipped 5 percent from last year, following a 4-percent drop in 1986. A projected 1987 year-end total of 312,000 tons is 7 percent off last year's total production of 334,170 tons.

Hamakua Sugar's production will be off over 10 percent because of a major plant consolidation consisting of increasing plant capacity to 175,000 tons, updating processing technology to improve processed sugar color, and expanding plant capacity to 200,000 tons. Other plans include increasing electrical capacity from 8- to 10-megawatts, and a pilot plant involving the high-tech processing of bagasse into other products.

Hilo Coast Processing Company (HCPC) production is off in part because of a plant breakdown, which halted

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production earlier this year for over a month. Plant production has also declined due to crop diversification into macadamia nuts. A power-supply contract dispute with HELCO and an Environmental Protection Agency suit over sewage dumping, presently costing the plant several million dollars, makes the company's long-term survival even more questionable.

DIVERSIFIED AGRICULTURE

Next to the visitor industry, diversified agriculture is fast becoming the most important contributor to the economic base of Hawaii County. The industry grew by 9 percent as of June 1987 with macadamia nuts leading the way. C. Brewer's Mauna Loa Macadamia Nut Processing Company, which owns half of all nut-bearing trees on the island, expects their macadamia nut crop to be up 10 percent from last year. A large part of this growth is attributable to increased sales of chocolate covered nuts. The $500,000 in plant expansion and over $4 million spent on advertising in 1986 have paid off, leading to a significant increase in demand for nuts.

While anthurium outshipments have declined through the first half of 1987, the industry remains strong and should rebound to end the year at about the same level as last year. However, tropical flowers and nursery products, through the first half of 1987, saw an increase in the total value of sales to $12.4 million, up 25 percent over sales during the same time in 1986.

The fruit fly problem continues to plague Big Isle papaya growers, but, as of yet, production and sales remain stable. The industry estimates that production for fresh sales will top 60 million pounds this coming 1987-88 fiscal year, representing a sizable increase over last year's total of 50 million pounds.

The industry's biggest problem remains infestation control. Fruit irradiation has been scientifically proven to be the most efficient process and the least damaging to the fruit. Initial feasibility studies for the construction of an irradiation pilot plant have been completed. The study proposes a joint funding agreement between the federal and state governments for $5 million in construction and operating expenses for three years. The industry hopes to have an operational facility in Hilo by 1990.

Hawaii guava growers estimate 1987 production at around 6 million pounds of fruit, a 17-percent increase over the 1986 production total. Due to higher per-acre yields harvested in 1987, this increase in production, combined with an average price advance to 11 cents per pound, resulted in a 24-percent expansion of crop sales value over last year.

The production of bananas through the first seven months of 1987 jumped by 17 percent over the same period last year. Kea'au Farms, the county's largest banana farm, intends to add another 150 acres to their existing 200 acres, in addition to boosting their crop yields to 30,000 pounds per acre. These actions could more than double current output over the next couple of years. Increased efforts in neighbor island as well as mainland marketing will accompany this growth in production.

Coffee production for 1987 is suffering some unexpected losses after a bumper crop last year. The 50 to 60 percent industry-wide decline is due to drought conditions earlier this year. However, with production picking-up and a two-year agreement between Superior Coffee and two Kona coffee cooperatives there is still optimism for Kona coffee in the future.

HIGH TECHNOLOGY INDUSTRIES

Support is growing for a Big Isle space industry. The recently completed Arthur D. Little feasibility study concluded: "A window of opportunity exists in the area of small-scale launch services, and the state would be well advised to capitalize upon this opportunity." It also noted that the southeast region of the Big Isle would be a prime location for such a small-scale space launch facility. As a result, the state, county, and many private concerns are actively moving toward the development of a space industry on the Big Island.

The Hawaii Ocean Science and Technology (HOST) park at Keahole Point has just recently broken ground. The 547-acre park was created by the State of Hawaii as a world-class center for large-scale commercial applications of ocean science and technology, and could provide as many as 2,000 jobs for local residents. A large 12-inch ocean water pipe will give the HOST park tenants a unique opportunity to use this extremely pure, cold, and nutrient-rich ocean water for a variety of commercial purposes such as specialized aquaculture, agriculture, ocean research, alternate energy, and desalination.

West Hawaii's Natural Energy Lab (NELH) is continuing its high-tech ocean research. The main focus of NELH is bringing cold deep-sea water to the surface for aquacultural purposes and for Ocean Thermal Energy Conversion (OTEC). A 40-inch deep-ocean water pipe, funded by the Department of Energy, is currently being constructed to augment the Lab's existing capacity. The Lab is in the process of closing down its closed-cycle OTEC research, opting for the more efficient open-cycle OTEC process. The advantages of the open-cycle process include greater efficiency, by-product production of fresh water, and less biological contamination of the system. A 100-kilowatt open-cycle pilot plant is currently under construction, and is expected to be completed in the next two years. OTEC research is still in its infancy in Hawaii, and is still a long way from producing any large amounts of electricity or water. However, ongoing research in this area continues to produce favorable results.

Aquacultural projects underway at NELH include lobster and oyster cultivation as well a research into possible commercial production of different varieties of salmon and trout, using the cold, nutrient-rich, deep-sea water. Cyanotech has had success in producing micro-algae for health foods, pharmaceutical dyes, and biofertilizers and recently procured two multi-million dollar contracts for further product research and development. Hawaiian Abalone Farms is currently doing quite well with average annual sales of $6 million. With expanding operations within the NELH compound and into the nearby HOST park, the company hopes to increase their share of the $250-million abalone market to 20 percent in the near future.

Atop Mauna Kea, construction of the $95-million W. M. Keck Observatory, housing the world's largest optical/infrared telescope measuring 10-meters in diameter, is in its second year of construction and should be completed sometime in 1990. In addition, the $130 million National New Technology Telescope (NNTT) has recently been approved by the federal government. It is estimated that the number of telescopes on Mauna Kea will double to 14 by the year 2000, and local employment in this industry could be as high as 500 persons.

Three developments that will certainly facilitate this expansion will be the completion of the summit road project, targeted for completion in 1989, completion of a fiber optic link connecting Halepohaku to the summit microwave communication station, and the approval of a two-year Observatory Technician degree program, proposed by the University of Hawaii, Institute for Astronomy.

ALTERNATE ENERGY

Alternate energy sources provide a considerable amount of energy on the Island of Hawaii. Electrical production from the sugar companies using combinations of bagasse, coal, and oil, is, to date, the most important source, providing an estimated 42 percent of all electricity produced.

However, geothermal power remains the greatest potential source of electrical energy to the Big Isle. Thermal Power Company's contract with HELCO to provide 12.5 megawatts of power by the end of 1989 represents a major commitment by a private company to geothermal development (see Economic Indicator front cover story). A third well that was recently completed has been determined to be commercially viable, but at least six more wells will be needed to provide the total 25 megawatts of power already contracted. Meanwhile, the HGP-A plant, which has been consistently providing 3 megawatts of power, recently completed the installation of a heat exchanger which transfers heat from the geothermal brine to a secondary water system. This heat exchanger is to be used for geothermal by-product research involving glass-making, cloth-dyeing, wood drying, plant germination, and processing of green papayas into powder.

Hawaiian Electric Co.'s $27-million feasibility study of a deep-water electrical transmission cable is expected to be completed in 1990. If the estimated $450-million undersea cable system is installed, it could transmit up to 500 megawatts of geothermal power from the Big Island to Maui and Oahu by the late 1990s. A gubernatorial advisory board was formed to examine developmental issues such as financing the project and organizing its implementation.

Thirty-seven Mitsubishi wind turbines were dedicated in July, completing the Kamao'a Wind Farm project in South Point. The windmills will generate a capacity of 10-megawatts, roughly 10 percent of HELCO's present capacity. The wind farm has a 15-year contract with HELCO to supply 10 percent of the Big Isle's peak electricity demand and about 5 percent of its normal usage. However, wind turbines cannot provide firm or consistent power to the utility company. So wind power will always be limited to reserve or back-up power when available.

CONSTRUCTION

The recent resort development explosion and the supporting infrastructure development has thrust the Big Island's construction industry into boom of unparalleled magnitude. Through June, construction-put-in-place stood at $65 million, a 30-percent increase from the same period last year. A continuation of this boom is supported, in part, by county construction permits. Through July, the value of residential permits increased to $55 million up 41 percent from the same period last year. Added to that, another $20 million in non-residential permits were granted. Moreover, planned construction over the next few years is phenomenal. At the present time, over $2 billion worth of construction, consisting of 4 major resorts, containing some 2,000 rooms, over 4,000 single-family homes, and some 5,000 multi-family condo units are in the final planning stages, and thousands more are proposed. Furthermore, another billion dollars is slated to be spent by federal, state, and county governments on infrastructure to support these proposed projects over the next three years.

GOVERNMENT

The county government faces many issues associated with the rapid development of the island. Infrastructure problems such as water availability, sewage and refuse disposal, traffic congestion, highway maintenance and expansion, and affordable housing are among the top priority items confronting the county.

Lack of an adequate water supply on the Big Island is an especially glaring problem with the droughts that have occurred in the past few years. Inadequate water supply has slowed housing development, since many developers cannot obtain the water commitments necessary for development approval. In an attempt to alleviate this problem the county is planning to drill three wells over the next 18 months, supplying an estimated 2-million gallons of water per day (Kona alone uses around 6 million gallons per day presently).

A problem with the disposal of sewage and solid wastes has also begun to appear. The Kona Sewage Treatment Plant is presently up to capacity, and additional development in the Kona region will require additional sewage plant systems. The County is presently spending $20 million over the next 6 years for a sewer system in Hilo and Kona. A new sewage plant in Kona is expected to be online by 1990. However, maintenance of the existing plants poses problems due to the age of the plants. Privatization of some of the smaller plants is being considered.

The County is also concentrating on the improvement of landfill operations to make more efficient use of existing land. The West Hawaii landfill has only 2 to 4 years remaining. This leaves three alternatives: expand the present landfill; transport the waste to Hilo; or develop a new landfill. In any case, waste reduction measures such as incineration and compacting are being implemented for the time being.

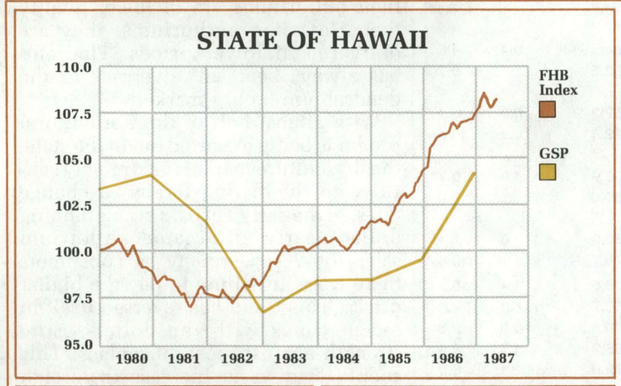
Maintenance and expansion of highways and county roads is also another problem faced by Hawaii. Traffic congestion in Waimea and parking and congestion problems in Kailua-Kona indicate that existing roads cannot handle the greater number of vehicles on the island. Some portions of the 975 miles of county roads are unpaved, and there are problems of inadequate drainage along many highways and streets. Impending visitor growth will greatly intensify the existing transportation dilemma. Improvements to the road systems of Hawaii are limited, however, because of insufficient funds. Ideally, $3,600 per mile is needed for highway maintenance, but the present budget allows for only $1,500 per mile.

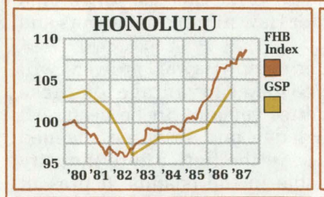
The county is addressing the island housing shortage, in part, with a pilot project in Kealakehe, between the Keahole Airport and Kailua-Kona. It will consist of a police station, boat harbor, sewage-treatment plant, golf course, schools, and expanded infrastructure, to go along with its 3,000 affordable homes.

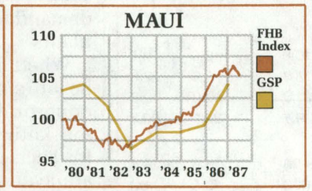
ECONOMIC INDICATORS

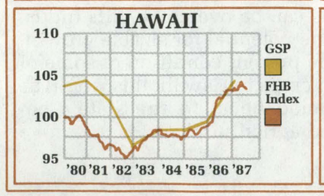
A Bimonthly Report on Current Economic Conditions in Hawaii
by the Research Department, First Hawaiian Bank
P.O. Box 3200; Honolulu, Hawaii; 96847
September/October 1987

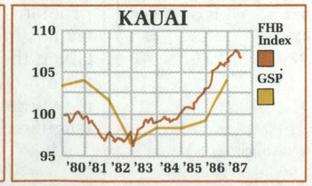
FIRST HAWAIIAN BANK











FIRST HAWAIIAN BANK INDEX OF LEADING ECONOMIC INDICATORS

The First Hawaiian Bank Index of Leading Economic Indicators, through the first seven months of 1987, registered a net gain of 0.3 percent from year-end 1986. This implies that economic growth statewide, should remain roughly at the same levels as 1986. Neighbor island indexes also reflected this scenario of stable growth, as declines in visitor counts curtailed last years upward momentum. A county-by-county analysis of the major index components, through July, shows that for Honolulu, employment, consumer credit demand, and public contracts awarded, showed significant upward movement, while building permits and visitor counts declined. The Maui index realized slight gains in employment and credit demand, but suffered heavy losses in visitor counts, and public contracts awarded. On the Big Isle, the only negative component was visitor counts, down just slightly from the previous month. For the Kauai index, visitor counts and public contracts awarded were the only negative components. All the other components showed gains.

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GEOTHERMAL POWER IN HAWAII

Development of geothermal power as a method of reducing Hawaii's dependence on imported foreign oil has long been a dream of scientists. Geothermal energy in Hawaii is produced through the release of superheated steam from volcanically heated groundwater. Electricity results from the piping of the steam through turbine generators. Conservative estimates are that the Big Island alone is capable of generating over 1,000 megawatts of energy. Since the average power consumption of the entire state is roughly 800 megawatts, it follows that the potential for energy independence is an attainable goal worthy of pursuit.

Research on geothermal energy began 26 years ago when four privately financed wells were drilled along the east rift zone of Kilauea Volcano on the Big Island. The first operational geothermal plant, named the Hawaii Geothermal Project Well-A (HGP-A) in honor of the late Dr. Agatin Abbott, was completed in 1981. The facility is currently supplying 3 megawatts of energy to Hawaii Electric Light Company (HELCO), which has been operating the facility since 1982. The first successful private effort began as a joint venture between Thermal Power Co. and Amfac. Known as the Puna Geothermal Venture, their objective was to construct a 25-megawatt geothermal power plant, which would supply roughly 25 percent of peak power demand on the Big Island. Under an agreement with HELCO, 12.5 megawatts will be delivered by the end of 1989 and the remainder by the end of 1993.

Geothermal development has also begun on Maui, where True/Mid-Pacific Geothermal Venture has acquired a lease on land along the southwest Haleakala rift zone to begin exploratory development.

True/Mid-Pacific Geothermal Venture has also received a permit to explore, develop, and market up to 100 megawatts of geothermal power on 9,000 acres of land owned by Campbell Estate in the Kilauea middle east rift zone on the Big Island. According to the company, the area has the potential for developing 400 megawatts of power, and the ability to develop this resource is well within the capabilities of the company.

The transmission of this power to Oahu will depend on the development of a deep-water transmission cable between Oahu and the Big Island. The estimated cost of the cable is $450 million; a feasibility study, expected to be completed in 1990, is being conducted by Hawaiian Electric Co. In the meantime, a state advisory board has been formed to examine developmental issues that a deep-water cable would provoke, such as financing the project and organizing its implementation. True/Mid-Pacific is optimistic about the future and feels that geothermal power can begin to flow to Oahu by 1995.

One of the problems associated with geothermal energy is the high development cost. Drilling a production well is estimated to cost $2-3 million, and it may take several attempts to hit a pocket of superheated groundwater sufficient to create a producing well. For a 25-megawatt plant, exploration and field development costs alone, may exceed $3 million, and the plant itself would cost roughly $60 million. On that basis, geothermal electricity would cost roughly 6.5 to 7 cents per kilowatt hour. That is higher than it takes to produce electricity on Oahu through the use of conventional oil-burning generators.

The higher cost of geothermal energy places it at a disadvantage compared to conventionally-produced energy. On the other hand, public-utility companies are under no legal obligation to buy power produced by private companies. Nor are they under any obligation to support the development of alternate energy sources. Utility companies are, thus, often unwilling to commit the large sums of money required to start a geothermal venture and the roughly 5 years needed to develop a facility unless it has a contract to supply a specific amount of electricity at a designated time. Thus, the uncertainties of world oil prices, market demand for energy, geothermal energy-development costs, and the reluctance of utility companies to commit themselves to advance energy-development contracts create further difficulties and risks for alternate-energy companies.

Other questions remain concerning the reliability and longevity of geothermal steam wells. Many feel that environmental issues have yet to be adequately addressed. Much will depend on the results of the 25-megawatt pilot plant now being developed by Thermal Power Co.

In summary, the potential for geothermal energy is now entering the critical stage of commercialization after 26 years of research and development. The future of alternate energy in Hawaii depends crucially on the success of current developmental efforts and the implementation of the deep-water transmission cable. There is no question that geothermal energy will play an increasingly valuable role in Hawaii's economic and energy future; the benefits from investing in its development and support will provide both energy independence, as well as strong and lasting economic returns to the State of Hawaii.

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SEPTEMBER/OCTOBER FEATURE STORY: HAWAII'S FLORICULTURE INDUSTRY

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CURRENT BUSINESS TRENDS

Hawaii's economy continued to exhibit robust growth in June. Gross business receipts for the state came to $2.4 billion, up 5 percent from June 1986. Even with slowdowns in Hawaii's two largest sectors, tourism and construction, total gross business receipts for 1987 were 12 percent ahead of last year. County figures through June also reveal that growth is occurring on all the islands. The Big Island economy is surging ahead by 20 percent. Oahu has seen 13-percent growth, while Maui and Kauai have experienced more moderate growth rates of 4 and 3 percent, respectively.

The continued decline in the unemployment rate is further evidence of Hawaii's energetic economy. The cumulative state average, through July, of 4.1 percent was a tenth of a percent lower than the June average, and 20 percent lower than what it was a year ago. If this trend continues through the second half of the year, 1987 will have the lowest unemployment rate so far this decade. Oahu's unemployment rate, as of July, was the lowest in the state at 3.7 percent, down 18 percent from last year. Kauai and Maui were next, each with a 4.5 percent cumulative average unemployment rate, 34 and 21 percent better than last year. Hawaii had the highest unemployment rate in the state at 6.5 percent, 21 percent lower than last year.

This encouraging performance by the economy comes as somewhat of a surprise when Hawaii's number one sector is examined. The visitor industry is not having a bad year in 1987, but it pales before the success of 1986. As of July, 3.3 million overnight-and-longer visitors have come to the islands,0.4 percent more than the same period last year. The westbound visitor count has lagged be-

u. s. economic indicators

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
GROSS NATIONAL PRODUCT**					
In Current Dollars	bil. $	2nd Qtr.	4,448 r	1.6	5.6
In 1982 Dollars	bil. $	2nd Qtr.	3,794 r	0.6	2.4
PERSONAL INCOME**	bil. $	July	3,738p	0.4	5.6
INTEREST RATES					
AVERAGE PRIME RATE	percent	August	8.25	0.0	4.4
CONSTRUCTION					
CONSTRUCTION PUT IN PLACE**	bil. $	June	392.4 r	−1.3	5.6
CONSTRUCTION COST INDEXES:					
Residences	1967 =100	May	381.5	0.3¹	2.3
Apts., Hotels, Office Bldgs.	1967 =100	May	379.4	0.3¹	2.3
EMPLOYMENT					
CIVILIAN EMPLOYMENT*	thous.	July	112,727	0.4	2.6
UNEMPLOYMENT*	thous.	July	7,224	−0.5	−12.2
UNEMPLOYMENT RATE*	percent	July	5.9	−1.7	−14.5
PRICES					
CONSUMER PRICE INDEXES:					
Wage Earners and Clerical Workers	1967 =100	July	335.6	0.2	3.9
All Urban Consumers	1967 =100	July	340.8	0.2	3.9
PRODUCER PRICE INDEXES:					
Finished Goods*	1967 =100	July	297.4p	0.2	3.6
All Commodities	1967 =100	February	308.5p	0.4	3.2

r=revised.
p=preliminary.
¹Compared to March, 1987.
*Seasonally adjusted.
**Seasonally adjusted at annual rates.

business activity in hawaii

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
BUSINESS SALES					
GROSS BUSINESS RECEIPTS:					
STATE	mil. $	Jan.-June	14,818.3	.....	12.4
Oahu	mil. $	Jan.-June	12,444.2	.....	12.9
Maui County	mil. $	Jan.-June	984.5	.....	3.5
Hawaii	mil. $	Jan.-June	1,008.9	.....	19.6
Kauai	mil. $	Jan.-June	380.7	.....	2.9
DIVERSIFIED MANUFACTURING	mil. $	Jan.-June	304.4	.....	7.7
DIVERSIFIED AGRICULTURE	mil. $	Jan.-June	140.2	.....	11.0
RETAILING	mil. $	Jan.-June	5,218.8	.....	7.4
WHOLESALING	mil. $	Jan.-June	3,619.4	.....	16.2
SERVICES	mil. $	Jan.-June	3,624.8	.....	12.9
OAHU NEW CAR SALES	number	Jan.-June	18,185p	.....	−5.0
HONOLULU PRICES					
HONOLULU CONSUMER PRICE INDEX:					
Wage Earners and Clerical Workers	1967 =100	July	320.8e	0.1	4.4
All Urban Consumers	1967 =100	July	313.5e	0.1	4.4
TOURISM					
VISITOR EXPENDITURES	mil. $	1986	5,550p	.....	13.3
OVERNIGHT OR LONGER VISITORS	number	July	524,950p	1.2	2.1
	number	Jan.-July	3,341,990p	.....	0.4
Westbound	number	July	374,890p	1.4	−3.8
	number	Jan.-July	2,464,560p	.....	−4.0
Eastbound	number	July	150,060p	15.7	0.7
	number	Jan.-July	877,430p	.....	15.1
AVERAGE DAILY VISITOR CENSUS	number	Jan.-July	119,890p	.....	−2.2
AVERAGE LENGTH OF STAY	no. of days	Jan.-July	10.2p	.....	0.0
MEETING ATTENDANCE	number	July	14,565	.....	−10.3
ORGANIZED GROUP TOURS	number	Jan.-July	451,930p	.....	−15.5
VISITOR COUNT BY COUNTY¹					
Oahu	number	July	290,420p	1.2	−4.3
	number	Jan.-July	1,804,670p	.....	−5.1
Maui County	number	July	167,190p	1.2	−7.2
	number	Jan.-July	1,123,070p	.....	−7.4
Hawaii	number	July	62,900p	−5.3	−8.8
	number	Jan.-July	474,830p	.....	1.8
Kauai	number	July	93,350p	2.9	−1.1
	number	Jan.-July	606,910p	.....	1.0

p=preliminary.
e=estimated.
¹Estimated Westbound.

public assistance in hawaii

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
PUBLIC ASSISTANCE					
INCOME MAINTENANCE:					
Recipients¹		June	48,609	−4.1	−10.5
Payments		Jan.-June	43,223	.....	−7.2
MEDICAL ASSISTANCE:					
Recipients¹		August	40,730	−11.8	−26.4
Payments		Jan.-Aug.	109,725	.....	1.3
FOOD STAMPS:					
Recipients¹		June	83,683	−0.4	−8.0
Payments		Jan.-June	42,791	.....	14.8
SERVICES:					
Recipients¹		2nd Qtr.	7,729	3.2	−7.2
Payments		2nd Qtr.	4,878	.....	11.5

¹Count of recipients is duplicated. A person may be counted in each category.

banking and finance in hawaii

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
FINANCE					
COMMERCIAL BANK DEPOSITS:					
STATE:					
Total Deposits	mil. $	July	8,799.7	0.6	13.1
Debits To Demand Deposits	mil. $	July	10,231.8	.....	5.1
OAHU:					
Total Deposits	mil. $	July	7,364.2	0.4	14.5
Debits To Demand Deposits	mil. $	July	9,252.5	.....	8.7
MAUI COUNTY:					
Total Deposits	mil. $	July	552.3	0.8	12.1
Debits To Demand Deposits	mil. $	July	422.6	.....	15.4
HAWAII:					
Total Deposits	mil. $	July	602.9	1.8	0.7
Debits To Demand Deposits	mil. $	July	380.0	.....	9.9
KAUAI:					
Total Deposits	mil. $	July	280.3	1.0	8.1
Debits To Demand Deposits	mil. $	July	176.7	.....	12.5
BANK LOANS OUTSTANDING—STATE:¹	mil. $	2nd Qtr.	5,408.6	3.4	16.9
Real Estate	mil. $	2nd Qtr.	2,350.7	7.3	24.6
Consumer	mil. $	2nd Qtr.	1,037.1	0.0	−2.5
Commercial & Industrial	mil. $	2nd Qtr.	1,585.7	1.7	18.5
Other	mil. $	2nd Qtr.	272.9	−8.1	6.9
CONVENTIONAL HOME MORTGAGE RATES: HONOLULU SAVINGS & LOAN ASSOCIATIONS:¹	percent	July	10.8	−0.9	3.8
TOTAL DEPOSITS	mil. $	March	3,517.8	0.6	−2.5
TOTAL LOANS	mil. $	March	121.0	20.0	82.8
MORTGAGE LOANS	mil. $	March	109.7	39.9	99.8
TAX COLLECTIONS:²					
STATE	thous. $	Jan.-July	1,107,408	15.9	14.4
Oahu	thous. $	Jan.-July	953,629	13.5	15.1
Maui County	thous. $	Jan.-July	67,577	15.0	13.5
Hawaii	thous. $	Jan.-July	60,427	17.3	12.0
Kauai	thous. $	Jan.-July	25,771	22.6	−1.8

¹Includes Hawaii and Guam. Reporting categories changed in July, 1985.
²Taxes collected by the State Department of Taxation. Excludes property taxes which were formerly collected by the State but are now collected by the Counties.

Association and the Hawaii Anthurium Growers Cooperative have managed to organize the anthurium growers on the Big Island emphasizing research, education, and marketing of their product. These cooperatives are the exceptions, however, as a majority of the growers in the state are not part of any ongoing promotional activity. In many instances an every-man-for-himself attitude prevails. In this environment it will be difficult for Hawaii products to maintain, much less increase, their market share in the face of increased competition.

The newest problem facing growers who want to expand is the increasing lack of available labor. As the Hawaiian economy fluctuates near full employment it has become more difficult to attract workers into this labor-intensive industry. This problem will intensify in the future as completion of several resort developments will increase the competition for the remaining workers, as well as entice some away from their present jobs.

Hawaii's industry must also deal with challenges from abroad in the form of foreign floricultural products. Floricultural producers from other countries are coming into direct competition with those from Hawaii. For example, Costa Rica, Jamaica, and Mauritius have aggressively entered into the anthurium market. Though their anthuriums are of lower quality than Hawaiian anthuriums, they are delivered at lower prices. Thailand has always been an adversary in the dendrobium orchid market.

With almost half of the floricultural products being exported out of the state, the floriculture market is extremely sensitive to fluctuating foreign exchange rates. In the early 1980s, a strengthening dollar nearly eliminated anthurium sales to West Germany as consumers there were unwilling to pay the higher prices. This trend has reversed itself in recent times with the dollar losing strength against most currencies. This should lead to an increase in foreign demand for Hawaii's exotic flowers and plants.

Whether or not Hawaii growers will be able to take advantage of these opportunities remains to be seen. All the knowledge and resources needed for success in the floriculture industry are available in the islands. If present problems can be overcome, this industry has the potential for sizable growth. Given the present condition of some of the other crops in Hawaii, this would be a welcomed boost to the state's beleaguered agricultural sector.

abroad (6 percent in Hawaii and 3 percent nationwide for the first quarter of 1987), demand for exotic plants has followed suit.

Tremendous growth for Hawaii's floriculture industry is possible given this pattern of increased demand. There are many areas that have yet to be penetrated by Hawaiian growers. The cut flower industry, for example, brings in $5 billion a year worldwide, and Hawaii has less than one percent of the market. Mainland consumers, in most markets, have been willing to pay higher prices for Hawaii's flowers and potted plants. Supply has a difficult time keeping up with demand right here in Hawaii. There have been instances when carnations have had to be imported from California and Israel to satisfy excess demand not met by local growers. Despite these opportunities for expansion, the number of farms in the state has declined from 680 in 1983 to 590 in 1986. Acreage in 1985 was greater than that in 1984, but was still less than the area used for floriculture and nursery products in 1983.

This lack of growth can be blamed on a number of local factors. The cost of land in Hawaii is one hinderance to further increases in production. While floriculture is not as land intensive as sugar or pineapple, high land prices have deterred farmers from expanding existing farms. Competing uses for the land have also put pressure on some farmers to reduce their operations. Capital costs have had their impact on output. Some growers either don't have the money or don't want to invest it in greenhouses, land preparation, and other improvements to increase productivity.

Getting the product to market has always been tricky. Floricultural products can only be delivered by air to insure freshness. Before the advent of jet cargo service, it was impossible to sell these products overseas. The cost of this method was prohibitive in the beginning, but now that airfreight rates have become more reasonable, transportation has become less of a problem.

Marketing Hawaii's products has also proven difficult. There is no industry-wide cooperative for the promotion of Hawaiian flowers and potted plants. Several product-specific cooperatives have been formed and have been quite successful. The Hawaii Protea Cooperative located in Kula, Maui has worked hard at marketing their product around the world, while trying to improve productivity by organizing the dissemination of seedlings and insecticides here at home. The Hawaii Anthurium Industry

employment and jobs in hawaii

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
EMPLOYMENT					
STATE:					
Civilian Labor Force	thous.	July	510.6p	0.3	3.2
Employment	thous.	July	490.4p	0.7	4.3
Unemployment	thous.	July	20.3p	−8.1	−18.5
Unemployment Rate	percent	July	4.0p	−7.0	−20.0
OAHU:					
Civilian Labor Force	thous.	July	382.8p	0.1	3.5
Employment	thous.	July	369.1p	0.4	4.5
Unemployment	thous.	July	13.7p	−7.4	−17.7
Unemployment Rate	percent	July	3.6p	−7.7	−20.0
MAUI COUNTY:					
Civilian Labor Force	thous.	July	50.4p	0.7	1.5
Employment	thous.	July	48.4p	1.4	2.7
Unemployment	thous.	July	2.1p	−8.7	−16.0
Unemployment Rate	percent	July	4.1p	−10.9	−19.6
HAWAII:					
Civilian Labor Force	thous.	July	53.6p	2.2	3.4
Employment	thous.	July	50.1p	3.3	5.4
Unemployment	thous.	July	3.6p	−7.7	−16.3
Unemployment Rate	percent	July	6.6p	−12.0	−20.5
KAUAI:					
Civilian Labor Force	thous.	July	23.9p	−0.4	1.5
Employment	thous.	July	22.9p	−0.2	3.6
Unemployment	thous.	July	1.0p	−13.6	−34.5
Unemployment Rate	percent	July	4.0p	−11.1	−35.5
JOB COUNT BY INDUSTRY					
TOTAL JOBS—STATE	thous.	July	506.1p	0.6	3.3
SUGAR (Mill and Field)	thous.	July	7.1p	7.6	−4.7
PINEAPPLE (Cannery and Field)	thous.	July	5.0p	12.4	−14.5
DIVERSIFIED MANUFACTURING					
(Excluding Sugar and Pineapple)	thous.	July	17.0p	1.2	0.9
Durable Goods	thous.	July	4.1p	2.5	5.1
Non-Durable Goods	thous.	July	12.9p	0.4	−0.4
Apparel and Textiles	thous.	July	3.1p	0.0	−6.1
DIVERSIFIED AGRICULTURE (Excluding Sugar And Pineapple, but including Agricultural Self-Employed)	thous.	July	9.4p	6.2	27.0
CONTRACT CONSTRUCTION	thous.	July	21.8p	0.0	15.3
TRANSPORTATION	thous.	July	24.8p	−0.6	1.0
COMMUNICATION	thous.	July	7.2p	0.7	2.1
UTILITIES	thous.	July	2.7p	1.9	3.8
RETAIL TRADE	thous.	July	101.9p	1.5	4.2
WHOLESALE TRADE	thous.	July	19.8p	1.3	1.8
FINANCE, INSURANCE AND REAL ESTATE	thous.	July	33.8p	0.4	1.5
HOTEL SERVICES—STATE	thous.	July	29.8p	0.0	1.0
Oahu	thous.	July	17.0p	1.5	3.0
Maui County	thous.	July	6.5p	−1.5	−1.5
Hawaii	thous.	July	3.9p	−2.5	−1.3
Kauai	thous.	July	2.5p	0.0	2.0
OTHER SERVICES	thous.	July	94.1p	0.2	4.7
FEDERAL GOVERNMENT	thous.	July	32.2p	0.0	0.9
Civilian Agencies	thous.	July	12.1p	0.0	4.8
Defense Department	thous.	July	20.0p	−0.5	−1.7
STATE GOVERNMENT	thous.	July	46.7p	−6.3	2.3
COUNTY GOVERNMENT	thous.	July	14.9p	13.7	1.7
NON-AGRICULTURE SELF-EMPLOYED	thous.	July	38.4p	2.8	3.1
UNEMPLOYMENT INSURANCE					
INSURED UNEMPLOYMENT (Weekly Average)	number	July	7,815	−8.2	−15.6
INTRASTATE INITIAL CLAIMS	number	Jan.-July	32,817	.....	−13.9
INTERSTATE INITIAL CLAIMS	number	Jan.-July	1,961	.....	−15.0
UNEMPLOYMENT INSURANCE BENEFITS	thous. $	Jan.-July	29,002	.....	−17.7

p=preliminary.
[1]Count of recipients is duplicated. A person may be counted in each category.

business activity in hawaii [cont.]

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
VISITOR ACCOMMODATIONS:					
STATE	number	Feb., 1987	65,318	.....	−1.5
Oahu	number	Feb., 1987	38,815	.....	−0.5
Waikiki	number	Feb., 1987	34,014	.....	−1.8
Maui (Island)	number	Feb., 1987	13,264	.....	−1.4
Molokai	number	Feb., 1987	575	.....	−9.4
Lanai	number	Feb., 1987	10	.....	0.0
Hawaii	number	Feb., 1987	7,328	.....	0.7
Kauai	number	Feb., 1987	5,956	.....	0.6
HOTEL OCCUPANCY:					
STATE	percent	July	83.2p	6.1	1.2
		Jan.-July	82.4p	.....	−1.6
Oahu	percent	July	90.6p	4.0	3.2
		Jan.-July	87.9p	.....	0.1
Maui (Island)	percent	July	72.6p	5.4	−12.6
		Jan.-July	77.2p	.....	−10.3
Hawaii	percent	July	57.4p	21.1	0.5
		Jan.-July	62.9p	.....	−1.3
Kauai	percent	July	78.4p	11.2	3.7
		Jan.-July	76.0p	.....	−3.2
DEFENSE EXPENDITURES					
APPROPRIATED FUNDS TOTAL	mil. $	Yr. to 2nd Qtr.	949.5	.....	0.1
Military Payroll	mil. $	Yr. to 2nd Qtr.	430.2	.....	4.5
Civilian Payroll	mil. $	Yr. to 2nd Qtr.	296.5	.....	−4.2
Local Purchases	mil. $	Yr. to 2nd Qtr.	222.8	.....	−2.0
SUGAR					
VALUE OF CROP SALES (Unprocessed Cane)	mil. $	1985	222.4	.....	−13.2
SUGAR PRODUCTION	thous. tons	Jan.-June	417.3	.....	−10.0
AVERAGE N. Y. RAW SUGAR PRICE	$/ton	Jan.-July	437.0	.....	4.9
PINEAPPLE					
VALUE OF CROP SALES (Fresh Equivalent)	thous. $	1985	90.5	.....	0.7
SHIPMENTS: FRESH	thous. lbs.	Jan.-July	139,905	.....	−0.7
DIVERSIFIED AGRICULTURE					
CROPS	thous. $	1985	132,126	.....	12.6
FLOWERS & NURSERY PRODUCTS	thous. $	1985	44,274	.....	13.8
Anthurium Outshipments[3]	th. dozens	Jan.-June	714.3	.....	−10.2
Potted Foliage Plants	thous. $	1985	12,019	.....	19.6
FRUITS & NUTS	thous. $	1985	43,244	.....	9.7
Papaya Sales	th. lbs.	Jan.-July	28,915	.....	−1.1
Average Farm Price	cents/lb.	July	19.0	−9.5	−6.9
Macadamia Nut Sales (in shell)	th. lbs.	1986	44,000	.....	4.8
Average Farm Price	cents/lb.	1986	80.0	.....	10.3
VEGETABLES AND MELONS[4]	th. lbs.	Jan.-July	41,580	.....	−0.4
LIVESTOCK	thous. $	1985	82,821	.....	−4.8
BEEF PRODUCTION (Dressed Wt.)	th. lbs.	Jan.-June	16,709	.....	3.2
Average Farm Price (Feedlot Beef)	cents/lb.	June	90.0	−1.6	16.9
HOG PRODUCTION (Dressed Wt.)	th. lbs.	Jan.-July	3,733	.....	4.3
Average Farm Price	cents/lb.	July	102.5	−1.0	−0.5
MILK PRODUCTION	mil. lbs.	Jan.-June	81.9	.....	2.1
Average Price Sold to Plants	$/100 lbs.	June	19.14	−3.0	2.1
EGG PRODUCTION	mil.	Jan.-July	131.4	.....	−1.6
Average Farm Price	cents/doz.	July	79.5	−2.5	3.9
PUBLIC UTILITIES					
ELECTRICITY GENERATED	mil. kwh.	Jan.-July	4,336.0	.....	2.3
GAS SALES	th. therms.	Jan.-July	29,776	.....	3.6
TELEPHONE LINES IN SERVICE	thous.	Jan.-July	490.6	.....	4.6

p=preliminary.
[3]From Hawaii County.
[4]Includes snap beans, cabbage, celery, sweet corn, cucumbers, onions, green peppers, tomatoes, and watermelons.

hind the 1986 count for most of the year, and July did nothing to change that trend. The cumulative total of 2.5 million westbound visitors for the first seven months of 1987 is 4 percent less than what it was in 1986. The eastbound visitor count, on the other hand, increased in 1987. The cumulative total has experienced double-digit growth all year. The seven month total of 877,430 is 15 percent higher than that in 1986.

Hotel occupancies are slightly below those of last year for the state, and most of the counties. As of July, hotels were 2 percent less full this year than in 1986. Oahu hotels were about as full with the occupancy rate for the first seven months only 0.1 percent off from the 1986 level. Hawaii and Kauai had more empty rooms this year with their occupancy rate down one and 3 percent, respectively. Maui hotels, boasting the highest room rates in the state, have suffered the largest decrease in occupancy this year. Cumulative figures through July show hotel occupancy down 10 percent from last year.

Construction is maintaining a healthy rate of growth in 1987. Construction-put-in-place figures for the first six months show that construction statewide had risen by 19 percent. Big Island construction increased by 29 percent over the same period last year. Oahu was second with an 18 percent upswing. Kauai and Maui enjoyed advances of 15 and 13 percent, respectively.

The real estate market is continuing its boom over 1986. Housing resales in both the single-family and condominium categories are showing impressive gains over last year in both number of units sold and average price. The resale of single-family units during the first seven months of 1987 was up 34 percent over 1986. The average price for units sold during that time has gone up from $182,345 in 1986 to $234,683 in 1987, a difference of 29 percent. In the condominium market, 1,128, or 52 percent more units have been sold between January and July of this year than in 1986. The average price has gone up by 15 percent from $110,110 to $126,637.

Agricultural crops continue to have a slow year in 1987. Sugar, which was doing well earlier in the year, experienced a 10-percent decrease in production in June, its second monthly decline. Similarly, cumulative anthurium outshipments were down by 10 percent. Total papaya sales and vegetable and melon production through July were depressed by one and 0.4 percent respectively.

HAWAII'S FLORICULTURE INDUSTRY

Sugar and pineapple have dominated Hawaiian agriculture for so long that few people realize there are other agricultural products being grown in the islands. In spite of a few exceptions, like Maui Onions and Kona Coffee, for the most part diversified agricultural products go unnoticed. However, Hawaii's moderate climate and fertile soil make it an ideal place to grow a variety of vegetables, fruits, and especially exotic flowers and plants. Indeed, the floriculture segment of the diversified agriculture market has bloomed into big business.

A variety of flowers and potted plants are produced in the islands. They run from the familiar dendrobium orchid to exotic protea. Popular flowers include roses, chrysanthemums, bird of paradise, ginger, poinsettias, and heliconia. Potted foliage plants of all types are also in demand.

In 1986, Hawaii ranked eleventh in total wholesale value of floricultural crops in the nation. In total foliage wholesale value, Hawaii was fifth. In the cut flower market Hawaii was the fourth largest producer in the country.

Locally, in terms of value of production, flowers and nursery products have ranked first among diversified agricultural crops for the last five years. In 1986, the last year for which data are available for diversified agriculture, the total value of production came to $49 million for the floriculture industry. That easily outdistanced crops such as coffee ($9 million) and macadamia nuts ($35 million). From 1971 to 1985 the floriculture industry grew at an average annual rate of 17 percent.

This growth continued through 1986 with sales increasing 11 percent to $49 million. Hawaii county contributed $22.8 million of that total, up 16 percent from 1985. The City and County of Honolulu received $20 million from the sale of floricultural products in 1986, up 10 percent from the year before. Maui and Kauai growers fared less well. Receipts for Maui came to $5.2 million in 1986, the same as the 1985 sales figure. Kauai suffered an 8-percent decrease in total sales from $1.2 million in 1985 to $1.1 million in 1986.

A breakdown of the 1986 figure shows that foliage and potted plants were the biggest money-makers earning 37 percent of the total. Sales increased by 9 percent from $16.5 million in 1985 to $17.9 million in 1986. This segment of the industry has grown steadily in five of the last six years.

Oahu was the major foliage producer in the state in 1986 with about $7 million in sales. The Big Island was second. Farms in the Kohala, Hilo, and Pahoa areas produced about $6 million worth of cut and potted foliage.

The next largest category in the floriculture industry is cut flowers, which, at $15.6 million in sales value, comprised 32 percent of the industry total for 1986. Anthuriums make up the lion's share of total cut flower sales, and made up 63 percent of total sales in 1986. Anthurium production has been increasing over the last ten years with an average annual growth rate of 16 percent. As with foliage products, export demand dominates the anthurium market. Other common flowers including chrysanthemums and roses had declining sales in 1986.

More exotic flowers, like bird of paradise are experiencing an upsurge in demand abroad as tastes turn to these more fascinating varieties. Protea growers, who are benefitting from the federal-government ban on South African protea products, are also doing well.

Cut flowers are grown all over the state. The Big Island produces and sells 98 percent of the anthuriums in the state, while Maui is the leader in protea cultivation. In 1986, Maui produced 95 percent of the state's protea. Oahu is the major grower of chrysanthemums, producing at least six times more than any other island.

Orchids continue to be one of Hawaii's most popular floricultural products. In 1985, orchid sales of $5.3 million were almost six times what they were 10 years ago. During that time, growers enjoyed a 21-percent annual sales growth rate. This continued in 1986 with an 11-percent increase over 1985. Record sales of dendrobium orchids, along with sales of other strains, added up to $5.9 million in 1986. Oahu and the Big Island produced the majority of orchids sold.

Export demand accounts for a large portion of floriculture sales. In 1986, total out-of-state sales amounted to $28 million or 57 percent of the total $49 million in sales. Foliage sales abroad accounted for two-thirds of total foliage sales in 1986. Eighty-eight percent of the anthuriums grown in Hawaii were exported especially to the Mainland, Japan, and Italy. Over half of the dendrobiums sold are to buyers from out-of-state. On the mainland, Hawaii's flowers are showing up in hotels, restaurants, offices, and private homes.

A general increase in demand for upscale items is one reason for this growing demand in floricultural products. As incomes have risen, both locally and

business activity in hawaii [cont.]

Series		Unit	Period	Number	Percent Change preceding period	Percent Change year ago
CONSTRUCTION PUT IN PLACE						
STATE:		thous. $	Jan.-June	1,039,394	.....	18.5
Oahu		thous. $	Jan.-June	901,098	.....	18.3
Maui County		thous. $	Jan.-June	52,974	.....	13.0
Hawaii		thous. $	Jan.-June	62,341	.....	28.7
Kauai		thous. $	Jan.-June	22,981	.....	15.2
HONOLULU CONSTRUCTION COST INDEXES						
SINGLE FAMILY		1967 =100	August	381.7	2.0	2.8
HIGH-RISE		1967 =100	August	392.3	0.8	1.2
PRIVATE PERMITS AUTHORIZED						
STATE:	RESIDENTIAL	thous. $	Jan.-June	352,029	.....	33.4
	Single Family Units	number	Jan.-June	3,287	.....	60.6
	Multiple Family Units	number	Jan.-June	826	.....	−49.9
	NONRESIDENTIAL	thous. $	Jan.-June	161,111	.....	−21.2
OAHU:	RESIDENTIAL	thous. $	Jan.-July	244,479	.....	22.4
	Single Family Units	number	Jan.-July	1,705	.....	51.8
	Multiple Family Units	number	Jan.-July	291	.....	−82.3
	NONRESIDENTIAL	thous. $	Jan.-July	120,559	.....	−4.4
MAUI CO.:	RESIDENTIAL	thous. $	Jan.-June	59,750	.....	38.3
	Single Family Units	number	Jan.-June	615	.....	42.0
	Multiple Family Units	number	Jan.-June	454	.....	567.6
	NONRESIDENTIAL	thous. $	Jan.-June	21,698	.....	8.7
HAWAII:	RESIDENTIAL	thous. $	Jan.-July	52,994	.....	35.1
	Single Family Units	number	Jan.-July	773	.....	17.7
	Multiple Family Units	number	Jan.-July	10	.....	−16.7
	NONRESIDENTIAL	thous. $	Jan.-July	20,412	.....	−85.8
KAUAI:	RESIDENTIAL	thous. $	Jan.-July	36,591	.....	56.4
	Single Family Units	number	Jan.-July	349	.....	51.1
	Multiple Family Units	number	Jan.-July	3	.....	—
	NONRESIDENTIAL	thous. $	Jan.-July	29,843	.....	−28.1
PUBLIC CONTRACTS AWARDED						
TOTAL GOVERNMENT PROJECTS:						
STATE		thous. $	Jan.-Aug.	251,265	.....	−19.1
Oahu		thous. $	Jan.-Aug.	191,833	.....	−20.4
Maui County		thous. $	Jan.-Aug.	17,416	.....	−49.6
Hawaii		thous. $	Jan.-Aug.	23,871	.....	4.9
Kauai		thous. $	Jan.-Aug.	18,146	.....	46.5
BY LEVEL OF GOVERNMENT:						
Federal		thous. $	Jan.-Aug.	57,477	.....	39.9
State		thous. $	Jan.-Aug.	113,976	.....	−33.3
County		thous. $	Jan.-Aug.	79,901	.....	−19.1
REAL ESTATE RESALES						
STATE:	Single Family	number	Jan.-July	2,300	.....	34.2
	Average Price	dollars	Jan.-July	234,683	.....	28.7
	Condominium	number	Jan.-July	3,307	.....	51.8
	Average Price	dollars	Jan.-July	126,637	.....	15.0
OAHU:	Single Family	number	Jan.-July	1,579	.....	38.0
	Average Price	dollars	Jan.-July	273,849	.....	32.8
	Condominium	number	Jan.-July	2,554	.....	54.7
	Average Price	dollars	Jan.-July	123,571	.....	18.0
MAUI CO.:	Single Family	number	Jan.-July	283	.....	29.2
	Average Price	dollars	Jan.-July	191,852	.....	11.0
	Condominium	number	Jan.-July	528	.....	47.9
	Average Price	dollars	Jan.-July	142,893	.....	−0.1
HAWAII:	Single Family	number	Jan.-July	341	.....	24.0
	Average Price	dollars	Jan.-July	114,227	.....	13.6
	Condominium	number	Jan.-July	111	.....	42.3
	Average Price	dollars	Jan.-July	138,737	.....	53.3
KAUAI:	Single Family	number	Jan.-July	101	.....	32.9
	Average Price	dollars	Jan.-July	139,766	.....	−4.5
	Condominium	number	Jan.-July	114	.....	22.6
	Average Price	dollars	Jan.-July	122,969	.....	28.1

n.a. = *not available.*

population in hawaii

Series	Unit	Period	Number	Percent Change preceding period	Percent Change year ago
POPULATION					
STATE:					
Total De Facto Population	thous.	July 1, 1986	1,178.8p	.....	2.3
Total Resident Population	thous.	July 1, 1986	1,062.3p	.....	0.8
OAHU:					
Total De Facto Population	thous.	July 1, 1986	877.3p	.....	1.4
Total Resident Population	thous.	July 1, 1986	816.7p	.....	0.7
MAUI COUNTY:					
Total De Facto Population	thous.	July 1, 1986	110.0p	.....	−4.8
Total Resident Population	thous.	July 1, 1986	87.6p	.....	2.7
HAWAII:					
Total De Facto Population	thous.	July 1, 1986	120.0p	.....	3.6
Total Resident Population	thous.	July 1, 1986	111.8p	.....	2.4
KAUAI:					
Total De Facto Population	thous.	July 1, 1986	60.3p	.....	8.5
Total Resident Population	thous.	July 1, 1986	46.4p	.....	3.6
CIVILIAN RESIDENT POPULATION:					
STATE	thous.	July 1, 1986	1,004.2p	.....	0.7
MILITARY PERSONNEL:					
STATE	number	July 1, 1986	58,584	.....	1.0
Ashore	number	July 1, 1986	53,616	.....	−0.4
Afloat	number	July 1, 1986	4,968	.....	19.5
CIVILIAN MILITARY DEPENDENTS	number	July 1, 1986	66,210	.....	3.0
FOREIGN IMMIGRATION[1]	number	Jan.-Aug.	3,867	.....	−1.6

p = *preliminary.*
[1]*Includes only those entering Honolulu ports and does not include status changes.*

income in hawaii

	Unit	Period			
INCOME					
TOTAL PERSONAL INCOME**	mil. $	1st Qtr.	16,158p	1.3	5.8
EMPLOYMENT INCOME[1]	mil. $	1st Qtr.	12,438p	1.2	7.0
Manufacturing	mil. $	1st Qtr.	548p	−1.1	3.2
Construction & Mining	mil. $	1st Qtr.	992p	0.7	29.2
Wholesale	mil. $	1st Qtr.	472p	0.2	4.7
Retail	mil. $	1st Qtr.	1,360p	1.3	5.0
Finance, Ins., & Real Estate	mil. $	1st Qtr.	922p	1.7	15.1
Trans., Comm., & Util.	mil. $	1st Qtr.	1,022p	2.2	9.1
Services	mil. $	1st Qtr.	3,067p	2.0	7.8
Farm & Other	mil. $	1st Qtr.	281p	−15.1	−36.3
Federal Civilian	mil. $	1st Qtr.	1,009p	1.7	3.9
Federal Military	mil. $	1st Qtr.	1,393p	2.3	3.4
State & Local	mil. $	1st Qtr.	1,373p	2.5	11.0
PROPERTY INCOME (Dividends, Interest, & Rent)	mil. $	1st Qtr.	2,271p	1.9	1.7
TRANSFER PAYMENTS (2,285) minus Personal Contributions for Social Insurance (835)	mil. $	1st Qtr.	1,450p	1.3	2.6
PER CAPITA PERSONAL INCOME:					
STATE	dollars	1986	14,691p	.....	6.1
Oahu	dollars	1984	13,709p	.....	5.7
Maui County	dollars	1984	11,611p	.....	5.9
Hawaii	dollars	1984	9,998p	.....	5.2
Kauai	dollars	1984	10,564p	.....	6.9

***Total personal income and all components are seasonally adjusted at annual rates.*
[1]*Includes wage and salary disbursements, proprietors' income, and other labor income.*
p = *preliminary.*

Office of the Mayor

Dante K. Carpenter
Mayor

November 30, 1987

Mr. Atsushi Mano
Senior Managing Director
Sumitomo Electric Industries, Ltd.
15, Kitahama 5-chome
Osaka 541, Japan

Dear Mr. Mano:

I'm writing to thank you for meeting with us and showing a strong interest in our geothermal project.

We hope to accelerate the development of our geothermal energy resource as soon as possible, and I am looking forward to sharing information about our geothermal resource and development plans in the future. A packet of more detailed information will be sent to you soon.

In the meantime, I am sending along a report on geothermal power in Hawaii County by First Hawaiian Bank, the second largest bank in Hawaii. I hope you find the report interesting. It was published coincidentally while we were in Japan.

I will be reporting back to the Governor's Advisory Board on the Underwater Cable Transmission Project, and I will convey to the members your thoughts on Hawaii as a bridge between the United States and Japan.

Again, I thank you for your kind interest and hospitality.

Sincerely yours,

Dante K. Carpenter
Mayor

Enclosures: Economic Indicators
Distribution List

NOV 16 1987

The MITSUBISHI TRUST and Banking Corporation
4-5, MARUNOUCHI 1-CHOME CHIYODA-KU
TOKYO 100, JAPAN

CABLE ADDRESS : MITUBISITRUST
TELEX : MBTRUST J24259

Tokyo, November 16, 1987

Mr. William Y. Kikuchi
Field Representative
U.S. Senator Daniel K. Inouye
101 Aupuni Street
Suite 204
Hilo, Hawaii 96720
U.S.A.

Dear Mr. Kikuchi,

We are very pleased to have a friendly meeting with you on Nov. 11, 1987 at our bank. Well, regarding the discussion that we had on that day, we are interested in the Geothermal Power Plant Project in Hawaii Island and we would like to know further information about the project in terms of its technical as well as its financial aspect.

Therefore, we would be very happy if you kindly provide us the figures and descriptions on the following questionnairs.

A. Technical Aspect

1. General Description of the project with the location map

2. Estimated cost of the project

Item	Number / length	Estimated cost (Million)
Civil Work	----	U.S. Dollar
Turbine Generator		U.S. Dollar
Cable	km	U.S. Dollar
Total		U.S. Dollar

3. Implementation schedule

4. Procurement Method (Tender or directly appointment)

B. Financial Aspect

1. Cashflow table

2. Method of finance, for example syndicated loan, Introduction of concessional loan etc.

3. Borrower of the loan together with guarantor, if any

4. Amount of money to be financed by private lenders

5. Term of loan

6. Method of repayment : Installment or bullet

C. Others

Status of this project; such as one of the U.S. National Projects directly backed up by the U.S. Government on the state of Hawaii projects directly backed up by the State Government.

Sincerely yours,

T. Teshima
Manager
International Finance Division